UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/605,271	06/28/2000	Christopher Henry Rohrs	200308340-1	5332

7590   11/29/2005

IP ADMINISTRATION , LEGAL DEPARTMENT
M/S 35 HEWLETT PACKARD COMPANY
P.O. BOX 272400
FORT COLLINS, CO   80527-2400

EXAMINER
ABEL JALIL, NEVEEN

ART UNIT	PAPER NUMBER
2165	

DATE MAILED: 11/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *9/30/2005*.

2a) ☒ This action is **FINAL.**   2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-26* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-26* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Remarks

1.   The Request for Reconsideration filed on September 30, 2005 has been received and

entered. Claims 1-26 are pending.

Claim Rejections - 35 USC § 102

2.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> (e) the invention was described in a patent granted on an application for patent by another filed in the United
> States before the invention thereof by the applicant for patent, or on an international application by another who
> has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention
> thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999

(AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002

do not apply when the reference is a U.S. patent resulting directly or indirectly from an

international application filed before November 29, 2000. Therefore, the prior art date of the

reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA

35 U.S.C. 102(e)).

3.   Claims 1-3, 6-11, 14-19, and 22-26 are rejected under 35 U.S.C. 102(e) as being

anticipated by Garthwaite (U.S. Pub. No2002/0161792 A1).

As to claims 1, 9, 17, and 25-26, Garthwaite discloses a collector for collecting non-

referenced objects stored in a heap by a program executing in a computer system comprising:

an object allocation routine which stores an object of a particular type in one of a

plurality of logical partitions in the heap dependent on a predefined category assigned to the

object type, such that each object of a certain category is stored in one logical partition of the

heap and objects of a category different from the certain category are stored in a logical partition

different from the one logical partition (See Garthwaite page 7, paragraph 0090, also see

Garthwaite page 8, paragraphs 0091-0093); and

a collection routine which searches one of the logical partitions of the heap for objects to

which references are made and reclaims non-referenced objects stored in the searched logical

partition of the heap (See Garthwaite page 6, paragraph 0063).

As to claims 2, 10 and 18, Garthwaite discloses further comprising:

a sample and logical partition routine which defines a category of an object stored in the

heap logical partition to be hot or cold (See Garthwaite page 10, paragraph 0110, also see

Garthwaite page 4, paragraphs 0038-0039).

As to claims 3, 11 and 19, Garthwaite discloses wherein upon determining that a hot

logical partition is full, the collection routine searches a cold logical partition and the hot logical

partition for referenced objects and moves referenced objects of the hot category stored in the hot

logical partition to the cold logical partition (See Garthwaite page 6, paragraphs 0059-0065, also

see Garthwaite page 9, paragraphs 0101-0102).

As to claims 6, 14 and 22, <u>Garthwaite</u> discloses wherein the sample and partition routine defines the object category dependent on object type mortality (See <u>Garthwaite</u> page 9, paragraphs 0106-0108).

As to claims 7, 15 and 23, <u>Garthwaite</u> discloses wherein the sample and partition routine estimates the object mortality dependent on difference of the number of bytes of the object type stored in the heap before a collection and the number of bytes of the object type stored in the heap after the collection (See <u>Garthwaite</u> page 9, paragraphs 0103-0104).

As to claims 8, 16 and 24, <u>Garthwaite</u> discloses wherein the sample and partition routine partitions the heap to minimize intergenerational pointers between a hot logical partition and a cold logical partition (See <u>Garthwaite</u> page 10, paragraph 0111).

Claim Rejections - 35 USC § 103

4.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5.   Claims 4, 5, 12, 13, 20, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over <u>Garthwaite</u> (U.S. Pub. No2002/0161792 A1) in view of <u>Ebrahim et al.</u> (U.S. Patent No. 5, 930, 807).

As to claims 4, 12 and 20, Garthwaite does not teach a write barrier elimination routine, which eliminates a write barrier for an intergenerational pointers between an object stored in a hot logical partition and an object stored in a cold logical partition.

Ebrahim et al. teaches a write barrier elimination routine, which eliminates a write barrier for an intergenerational pointers between an object stored in a hot logical partition and an object stored in a cold logical partition (See Ebrahim et al. column 8, lines 11-57, also see Ebrahim et al. column 12, lines 38-51, also see Ebrahim et al. column 13, lines 1-35).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention was made to have modified Garthwaite to include a write barrier elimination routine, which eliminates a write barrier for an intergenerational pointers between an object stored in a hot logical partition and an object stored in a cold logical partition.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Garthwaite by the teaching of Ebrahim et al. to include a write barrier elimination routine, which eliminates a write barrier for an intergenerational pointers between an object stored in a hot logical partition and an object stored in a cold logical partition because it provides for faster processing by reducing memory overhead.

As to claims 5, 13 and 21, Garthwaite as modified discloses wherein the write barrier elimination routine eliminates a write barrier by replacing a write barrier machine code instruction with a no operation machine code instruction (See Ebrahim et al. column 8, lines 11-57, also see Ebrahim et al. column 12, lines 38-51, also see Ebrahim et al. column 13, lines 1-35, also see Ebrahim et al. column 10, lines 6-25).

Response to Arguments

6.   Applicant's arguments filed on September 30, 2005 have been fully considered but they

are not persuasive.

In response to applicant's argument that "Garthwaite does not disclose any assignment of

predefined categories to object types" is acknowledged but not deemed to be persuasive.

The Examiner maintains that Garthwaite teaches the argued limitaion and specifically as

pointed out by the Applicant (Response page 3, Garthwaite page 8, paragraph 0094) by placing

"popular" objects (i.e. certain types) in different "cars" (i.e. categories). Garthwaite's system

organizes objects not only in "cars" but also according to the class they were initially defined in

(Figure 9, 108, type, and Figure 10, 112, class).

In response to applicant's argument that the references fail to show certain features of

applicant's invention, it is noted that the features upon which applicant relies (i.e., the character

object type in JAVA™ is char[ ] used to store character strings; well-known examples of object

types include integers, and floating-point numbers) are not recited in the rejected claim(s).

Although the claims are interpreted in light of the specification, limitations from the specification

are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir.

1993).

The Examiner refers to the applicant's response pages 2 and 3 not only does the

Applicant contends that the instant application uses JAVA™ programming language object types

(specification given examples not claimed) to be well known in the art to include (i.e. character strings, integer, or floating-point numbers); thereby making it unclear to the Examiner which example falls into the scope of the claim but also shows lack of novelty. Furthermore, in making a reference to JAVA™ type objects specifically; the Examiner points to the cited art Garthwaite teaches using high level language JAVA™ programming language to implement his invention whereby by showing the storing of object type in predefined categories (Figure 9, 108, type, and Figure 10, 112, class). Furthermore, indeed the use of integers in JAVA™ programming language is well known in the art as disclosed in the Examiner's second cited reference Ebrahim et al. column 4, lines 9-31, and column 7, lines 17-19.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e. the mortality of a particular object type represents a measure of the probability that objects of that type will survive a further garbage collection) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

The Examiner also points out that the combination of Garthwaite with Ebrahim et al. teaches on Garthwaite page 4, paragraphs 0034-0035, and Garthwaite page 4, paragraph 0042 that there are storage distinction in the heap made between the stored objects which "survive" and objects which "die" during the garbage collection process.

Conclusion

7.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time

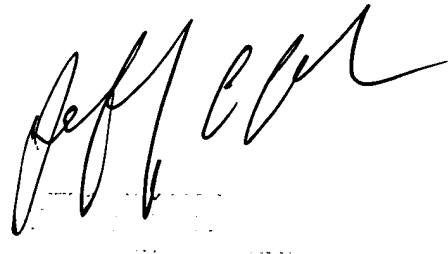policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing

date of this final action.

8.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Neveen Abel-Jalil whose telephone number is 571-272-4074.

The examiner can normally be reached on 8:30AM-5:30PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Jeffrey A. Gaffin can be reached on 571-272-4146. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Neveen Abel-Jalil
November 25, 2005